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QUESTION OF ANTARCTICA

Report of the Secretary-General

I. INTRODUCTION

1. By its resolution 48/80 of 16 December 1993, the General Assembly, reaffirming the principle that the international community is entitled to information covering all aspects of Antarctica and that the United Nations should be made the repository for all such information in accordance with Assembly resolutions 38/77 of 15 December 1983, 39/152 of 17 December 1984, 40/156 A and B of 16 December 1985, 41/88 A and B of 4 December 1986, 42/46 A and B of 30 November 1987, 43/83 A and B of 7 December 1988, 44/124 A and B of 15 December 1989, 45/78 A and B of 12 December 1990, 46/41 A of 6 December 1991 (which requested the Secretary-General "to monitor and gather information within existing resources on the state of the environment in Antarctica and to submit an annual report to the General Assembly") and 47/57 of 9 December 1992, encouraged the Antarctic Treaty Consultative Parties 1/ to provide to the Secretary-General, on a continuing basis, more information and documents covering all aspects of Antarctica, and requested the Secretary-General to submit a report on his evaluations thereof to the Assembly at its forty-ninth session.

2. With regard to the implementation of paragraph 10 of General Assembly resolution 48/80, the Department of Public Information confirmed that all information activities required by that resolution had been carried out within existing resources.

3. On 2 August 1994, in accordance with the above resolutions, the Under-Secretary-General and Executive Director of the United Nations Environment Programme, at the request and on behalf of the Secretary-General of the United Nations, addressed a note verbale to the Permanent Representative of Japan to the United Nations in his capacity as convener of the Informal Group of Antarctic Treaty Consultative Parties, requesting a reply pursuant to paragraph 4 of General Assembly resolution 48/80 as soon as possible but no later than 31 August 1994.

4. On 22 September 1994, the Secretary General received the following reply from the Permanent Representative of Japan to the United Nations, responding on behalf of the States Parties to the Antarctic Treaty:

> "The Permanent Representative of Japan to the United Nations presents his compliments to the Secretary-General of the United Nations and, pursuant to his note of 2 August 1994, sent on behalf of the States parties to the Antarctic Treaty, has the honour to enclose herewith two English-language copies of the final report of the Eighteenth Antarctic Treaty Consultative Meeting, held at Kyoto from 11 to 22 April 1994."

5. Letters were also sent to the relevant specialized agencies, programmes, organizations and bodies of the United Nations system and to relevant intergovernmental and non-governmental bodies, inviting them to submit, not later than 30 July 1994, information on but not necessarily limited to the state of the environment in and around Antarctica and its ecosystems.

6. As of 15 August 1994, information had been received from the following organizations: the Antarctic and Southern Ocean Coalition (ASOC), the Antarctica Project, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Council of Managers of National Antarctic Programmes (COMNAP/SCALOP), Greenpeace, the Intergovernmental Oceanographic Commission (of UNESCO) (IOC), the International Hydrographic Organization (IHO), the International Maritime Organization (IMO), the International Whaling Commission (IWC), the Scientific Committee on Antarctic Research (SCAR), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP), the World Conservation Monitoring Centre, the International Union for Conservation of Nature and Natural Resources-the World Conservation Union (IUCN) and the World Meteorological Organization (WMO). The information provided has been taken into account in the preparation of this report.

7. Certain aspects of the environmental issues discussed in this report were also dealt with in the Secretary-General's reports on the question of Antarctica submitted to the General Assembly at its forty-eighth session (A/48/449), forty-seventh session (A/47/624), forty-sixth session (A/46/590), forty-first session (A/41/722) and thirty-ninth session (A/39/583).

8. This report updates the previous reports of the Secretary-General to the General Assembly on the state of the environment in Antarctica.

II. THE STATE OF THE ENVIRONMENT IN ANTARCTICA

9. The area south of latitude 60° is generally considered as Antarctica, which includes the Antarctic continent, surrounding ice shelves and the ocean out to the Antarctic Convergence zone (where the cold surface waters spreading from the continent meet the warmer surface seas), and islands of both the subantarctic and the maritime Antarctic zone. Climatically, it is extremely cold and inhospitable; because of its geographical isolation and uniqueness, the area is precious to the whole world as a natural "laboratory" and environmental observation post.

10. As indicated in the Secretary-General's reports on the question of Antarctica submitted to the General Assembly at its forty-sixth session (A/46/590) and forty-eighth session (A/48/449), Antarctica plays a critical role in the global environment through its influence on the circulation of air and ocean masses and on climate conditions. Antarctica has become a centre for scientific programmes and for peaceful cooperation between nations. 2/

11. The preamble to the Protocol on Environmental Protection (Madrid Protocol) affirms that the development of a comprehensive regime for the protection of the Antarctic environment is in the interests of mankind as a whole. 3/ The international cooperation exhibited in both the creation and the adoption of the Madrid Protocol bodes well for the future of Antarctica and its surrounding areas.

12. From being an uninhabited and virtually unvisited continent some 35 years ago, Antarctica now has a year-round "population". Several hundred people occupy permanent stations during the winter months, and their numbers rise to several thousand at those and temporary stations during the summer months. Tourists, although still modest in number, are regular visitors to certain parts of Antarctica. The gradual but steady growth of human activity in Antarctica has brought with it a growing interest on the part of States, conscious of their rights and responsibilities in relation to the activities of their nationals and of the opportunities traditionally afforded by "empty areas, especially in a world where such areas have been fast disappearing". 4/

13. The Eighteenth Antarctic Treaty Consultative Meeting (XVIIIth ATCM) was held at Kyoto, Japan, from 11 to 22 April 1994.

14. The following issues were taken up at the XVIIIth ATCM:

(a) Operation of the Antarctic Treaty system: reports:

(i) Under recommendation XIII-2 of the Antarctic Treaty;

(ii) In relation to article III (2) of the Antarctic Treaty;

(b) Protocol on Environmental Protection to the Antarctic Treaty:

(i) Implementation;

(ii) Committee for Environmental Protection;

(iii) Liability annex;

(iv) Relations with other environmental treaties;

(c) Tourism and non-governmental activities in the Antarctic Treaty area;

(d) Operation of the Antarctic Treaty system: logistics:

(i) Secretariat;

(ii) Public availability of documents;

(iii) Examination of recommendations;

(iv) Exchange of information;

(e) Inspections under the Antarctic Treaty system:

(i) Inspections during 1992/93 and 1993/94 and those planned for 1994/95;

(ii) Inspection check-lists;

(f) Environmental monitoring and data:

(i) Environmental monitoring of the impact of human activities in the Antarctic;

(ii) Global change;

(iii) Data management;

(iv) Regulation of the extraction, use and custody of scientific samples obtained in the Antarctic;

(g) Implementation of environmental impact assessment procedures:

(h) The Antarctic protected area system:

(i) Revised management plan for specially protected areas (SPAs) and Sites of Special Scientific Interest (SSSIs);

(ii) Historic sites and monuments;

(iii) Review and implementation of the system;

(i) International Antarctic scientific and logistic cooperation;

(j) Antarctic meteorology and telecommunications;

(k) Marine hydrometeorological services to navigation in the southern Ocean;

(l) Questions related to the exercise of jurisdiction in Antarctica.

15. The meeting received reports from the following:

(a) the Chairman of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);

(b) the head of the delegation of the United Kingdom of Great Britain and Northern Ireland in his capacity as representative of the Depositary Government of the Convention for the Conservation of Antarctic Seals (CCAS);

(c) the President of the Scientific Committee on Antarctic Research (SCAR);

(d) the head of the delegation of the United States of America in his capacity as representative of the Depositary Government of the Antarctic Treaty;

(e) the convener of the Informal Group of Antarctic Treaty Consultative Parties;

(f) the Chairman of the Council of Managers of National Antarctic Programmes (COMNAP);

(g) the representative of the International Hydrographic Organization (IHO);

(h) the representative of the World Meteorological Organization (WMO);

(i) the representative of the Antarctic and Southern Ocean Coalition (ASOC);

(j) the representative of the International Union for Conservation of Nature and Natural Resources-World Conservation Union (IUCN);

(k) the representative of the United Nations Environment Programme (UNEP).

16. Despite its remoteness, Antarctica is not immune from the atmospheric pollution of industrialization. The ice sheet is the main sink for atmospheric pollution reaching the Antarctic from other continents. In addition to this external source, the human presence in Antarctica contributes to the contamination of the air. Locally produced pollutants may be dangerous to the Antarctic environment and are not yet adequately monitored. Although the air over certain areas around stations and field camps is contaminated by emissions from power generation, vehicles and waste burning, these areas are still relatively small and confined. 5/

17. Once air masses reach Antarctica, pollutant particles and gases are incorporated into snowflakes and deposited as snow. Because snow is laid down on the ground surface sequentially, and usually does not melt, an historical record of the composition of the atmosphere can be recovered and examined. Antarctic ice is seen as the main document of greenhouse gas concentrations for times before atmospheric measurements were done systematically. There is concern that even the currently tiny Antarctic population of humans may affect the usefulness of Antarctic data as a relatively untainted source of information on the worldwide growth of pollution and its transportation via the atmosphere. 5/

18. Antarctic ozone depletion is an unexpected and far-reaching consequence of industrial pollution. The atmospheric transport of pollutants and the unique features of the winter Antarctic stratosphere create the ideal conditions for ozone depletion in the austral summer. The formation of the polar vortex isolates a large cold-air mass. Polar stratospheric clouds within the vortex

provide a substrate for the ozone-destroying photochemical reactions that are catalysed by early springtime sunlight. These reactions result in a seasonal increase of biologically harmful ultraviolet (UV) radiation reaching the Earth's surface. 6/

19. ASOC submitted to the XIIth CCAMLR meeting a background paper on Antarctic ozone depletion which indicated that in 1993 the ozone hole extended over 22 to 24 million square kilometres of the south polar region (the Antarctic continent itself covers 14 million square kilometres), signifying that the hole was at least as large as it was in 1992. 7/

20. Included in the Secretary-General's report on the state of the environment in Antarctica to the General Assembly at its forty-eighth session (A/48/449) was an outline of the programme proposed by SCAR to coordinate research on global change in the Antarctic. The project related to Antarctic stratospheric ozone, tropospheric chemistry and the effect of ultra-violet radiation on the biosphere would update the status of ozone depletion over Antarctica. The SCAR Group of Specialists on Global Change and the Antarctic (GLONCHANT) commenced its work, holding meetings in 1993 and 1994 to initiate, promote and coordinate the programme's projects. 8/

21. Ecotoxicological research in the Antarctic is conducted to identify and monitor the worldwide distribution of contaminants and the effects of efforts to control contaminants. Long-range transport by wind is largely responsible for the presence of organochlorines on the continent. The distribution and deposition of many pollutants in the atmosphere show seasonal patterns correlated with temperature. In Antarctica, atmospheric levels of lindane, for example, were positively correlated with temperature, and a significant difference was found between spring-summer and summer-winter concentrations. 9/ Organochlorines have been widely observed in the Antarctic, but current investigations are not structured to provide comparable results within long-term monitoring programmes. The Netherlands is currently compiling an inventory of current research in an attempt to design and test new approaches, with the goal of providing advice on the design of an efficient monitoring system of organochlorine pollutants in the Antarctic ecosystem. 10/

22. Carbon dioxide and methane levels in the atmosphere are of particular concern because they contribute to the well-known "greenhouse effect". In Antarctica, even a slight increase in temperature at higher latitudes could cause thawing of the ice and, consequently, a significant rise in sealevel. 11/

23. As is its atmosphere, Antarctica's terrestrial environment is extremely vulnerable to the effects of human activity. Damage is generally slow to correct itself and often justified as a "local" disturbance, probably less than 1 square kilometre on average. Any human activity in Antarctica will have some effect on the environment. The question is whether the value of the activities undertaken outweighs the inevitable environmental effects and whether it is possible to minimize the effects without undermining the value of the activity. 12/

24. Vital to any plan for the preservation of the Antarctic environment is the management of solid and hazardous wastes there. Some countries have waste

management plans that, if properly implemented, could prevent serious or irreversible environmental damage. 13/ Among the papers submitted to the XVIIIth ATCM was one waste management strategy from Australia on the common requirements for managing waste: classification, collection and streaming, containers and storage, labelling and identification, information, education and training, together with guidelines for implementation. 14/

25. Greenpeace evaluated the effect on the surroundings of the construction and removal of the their World Park Base (Cape Evans, Ross Island) in Antarctica. There are only a few general surveys and limited specific case studies on the physical impact of human activities on Antarctic substrata. These activities may result in ground disturbances, tracking, dust generation and deposition, permanent ice retreat, induced effects of snow accumulation and the presence of foreign materials, resulting in significant substratum degradation. Any removal, damage or compaction of the substratum surface can alter the thermal balance of the ground, triggering processes of permafrost degradation. Modification of substratum structure may change the permafrost levels for very long periods of time. Observations in the area of McMurdo Sound indicate that there has been no re-establishment of an icy permafrost layer in disturbed materials after 30 years, suggesting that recovery must be very slow. Given the number of bases in and around Antarctica, the potential for disrupting normal soil processes is immense.

26. The Greenpeace 1992/93 Antarctic expedition report, issued in April 1994, includes an update on the environmental conditions and the continued scientific monitoring of the former World Park Base site. This information is useful for the evaluation and development of future projects that may affect the terrestrial Antarctic environment.

27. The ASOC report to the XVIIIth ATCM encouraged Parties to ratify the Madrid Protocol, and to act to ensure that the Protocol is implemented so as to afford the greatest protection to the Antarctic environment. 15/

28. The IHO's recently established permanent working group on hydrographic cooperation in Antarctica, held its first meeting in Chile, in July 1993. The Working Group acknowledged the contributions to and progress on the international chart scheme for Antarctica. It noted that source data beyond systematic hydrographic surveys are required to compile navigational charts of the area, and requested that such data be publicized in order to avoid duplication of effort. 16/ The IHO publication on the status of hydrographic surveying and nautical charting in Antarctica contains current charts and surveys of the Antarctic area. 17/

29. The IUCN presented a paper at the XVIIIth ATCM that examines the effectiveness of both the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) and the Madrid Protocol in protecting the Antarctic marine environment from oil, noxious liquid substances, garbage and sewage. The paper emphasizes the need to include the rules adopted for the exchange of information, as required by the Antarctic Treaty, and recommends inspections by a non-governmental body as an objective means for determining compliance. It includes a questionnaire related to marine pollution sent to all members of COMNAP with a summary of responses to date, and concludes that the

most promising way to prevent marine pollution is through the enforcement of existing regulations. 18/

30. COMNAP reported to the ATCM that it is committed to giving priority to the development of strategies for the prevention of oil spills, and is preparing draft guidelines to facilitate this. 19/ On the issue of ship safety, COMNAP will defer to IMO for expert discussion of the following principles: minimum safety standards, different classifications for different ship uses, and whether Antarctica should be considered a "particularly sensitive area" under the IMO-MARPOL 73/78 Convention.

31. Annex IV of the Madrid Protocol is the basis for regulation of pollution prevention in the Southern Ocean. Rapid ratification of the Protocol by all countries is a priority, but enforcement of the Protocol relies heavily on MARPOL 73/78's rules for enforcement (except its annex IV on sewage, which is not in force). 18/ This is discussed further below.

32. All major classes of hydrocarbons have been found at low concentrations in the Antarctic ecosystems. It is difficult to determine what is naturally present and what is anthropogenic. The latter is presently low and difficult to distinguish from background levels. Pollution in Antarctica is as yet limited to a few sources, and although contamination can be locally heavy, it is very restricted in extent. The low levels of natural hydrocarbons and restricted human activity make the Antarctic ecosystem suitable as an indicator of global hydrocarbon pollution. 20/

33. The report of the Commission for the Convention for Conservation of Antarctic Marine Living Resources was presented to the XVIIIth ATCM by its Executive Secretary on behalf of its Chairman.

34. Krill (Euphausia superba) are small shrimp-like crustaceans common to the frigid waters of Antarctica and a primary source of food for whales, sea birds, fish, squid, seals and penguins. Krill are also harvested for human and livestock consumption by Chile, Japan, Poland, the Republic of Korea, Russia and Spain. 21/

35. Total krill fishing in all Antarctic waters during 1992/93 was reduced to 88,000 tonnes. This was 70 per cent less than the 298,000 tonnes reported in 1991/92 season, in which Polish catches increased, but Japan, Chile, Ukraine, and Russia took lower catches (there were fewer vessels from the former Soviet Union, and Japan decreased its fishing effort. 22/ The United States National Oceanic and Atmospheric Administration (NOAA) conducted a two-month survey in the Antarctic and found that krill is one fifth as plentiful as usual; this is the second year in a row that the population has decreased. 21/ Low krill numbers are a source of concern, but there is no definitive way to determine if the decrease is due to natural cycles, overfishing, or a combination of the two and other factors. The Convention on the Conservation of Antarctic Marine Living Resources requires reporting of krill catches in Antarctica. Last year's catches in the south-west Atlantic area were at safe levels, less than one fifth of the CCAMLR precautionary catch limit of 1.5 million tonnes. 22/

36. For the third year, the CCAMLR secretariat carried out an analysis which showed that the krill fishery (sub-areas 48.1 and 48.2) overlaps the foraging ranges of krill-dependent predators at a critical time of year (from December to March, when the foraging range is restricted by dependent offspring). Data about the effect of fishing at this time are inadequate, but it has been identified as an area of concern to be addressed by fishing nations. 22/

37. The ecological implications of krill fishing were also discussed at the XIIth CCAMLR meeting. Japan presented a paper concluding that, since krill catches in a sub-area were low compared to the local krill biomass, it was unlikely that the fishery would be having an adverse effect on predators. Nevertheless, precautionary measures were still deemed necessary, as questions about predator-prey relationships remain unanswered. Substantial uncertainty persists about the effects of fishing on target and dependent species in localized areas. In light of the unanimous concern about these species, research in this area was made a priority, together with the definition of the options for implementing a precautionary approach to minimize the effects of fishing on dependent species. 22/

38. The XIIth meeting of CCAMLR readjusted some of the total allowable catches for various fish species, primarily the Patagonian tooth fish, within the fisheries of the Convention area. 22/

39. The most widespread pollutants in Antarctica are petroleum-related. Fuel used to support scientific stations and transportation activities is most likely to contaminate the surrounding environment. Hydrocarbon exposure in marine organisms is often measured by determining the levels of polycyclic aromatic hydrocarbons (PAH) in tissues; studies indicate that the presence of PAH metabolites in bile is correlated with the level of PAH exposure in fish. 23/

40. In a survey of hydrocarbon contamination in Antarctic fish captured near a scientific station, adjacent to a shipwreck and at locations distant from known human activities, there was a measurable biological response in fish near the station and the shipwreck. This is evidence that human activities that release PAH are contaminating marine organisms. 23/

41. Penguins are one of the top predators in the Antarctic food chain, especially of krill, and knowledge of their numbers and habits is essential to understanding their role in the ecosystem. There are many areas of Antarctica with no data, or no current data, on penguin populations. Details of the available data are in the report by SCAR submitted to the XVIIIth ATCM. 24/ CCAMLR also reviewed data on predator and prey species and their interactions with the environment. Unfortunately, data were received from only three members of CCAMLR. 22/

42. A population-wide mortality event of South Polar skua chicks occurred during a diesel-oil spill from the Bahía Paraiso at Palmer Station, Antarctica, in 1989. It was hypothesized that sub-lethal oiling of adult South Polar skuas temporarily disrupted parental guarding of chicks. Unattended chicks are often preyed on by other skuas, and all known chicks within the local population were lost. Other researchers have proposed that this reproductive failure was unrelated to the presence of oil, but this seems highly unlikely. 25/

43. The spill occurred at the peak of hatching for South Polar skua chicks, thus creating pre-spill and spill groups of age-matched chicks. All South Polar skua chicks in the 1989 sample that were alive when the spill began died within a three-week period while oil was present, although during the oil spill few chicks appeared to die from starvation or during storms. However, instances of parental neglect increased tenfold coincident with the spill; significant increases in chick loss to intraspecific predation occurred (many young were found injured, killed or eaten by other skuas). It is likely that both oil exposure and food limitation contributed to the stress on the skua adults and chicks, but because natural populations are complex and subject to many physical and biological variables, it is not certain that the spill was solely responsible for the mortality rate. This illustrates the difficulty of determining the full impact of an oil spill. Sub-lethal effects of oil have the potential to affect more sea birds than direct effects of oil. When significant reductions in fitness or longevity occur, the effects may be catastrophic. 25/

44. A comprehensive report was submitted by Australia on the status of the albatross. Incidental mortality in fisheries has been implicated in the decline of a number of albatross species, in particular the Wandering Albatross. Information from the United Kingdom on Bird Island, South Georgia, indicated a decline in numbers. This decline also reflected incidental mortality associated with fisheries. 22/

45. The head of the delegation of the United Kingdom of Great Britain and Northern Ireland, presented a report in his capacity as representative of the Depositary Government of the Convention for the Conservation of Antarctic Seals.

46. CCAMLR reviewed data on predator and prey species and found that the 1992/93 breeding season for seals was similar to the previous season's, and that the breeding and reproductive performance of seals and resultant population sizes were good. The only significant change was an increase in duration of foraging by fur seals. 22/

47. The pack ice surrounding Antarctica is home to over 50 per cent of the world's population of seals (80 per cent of the world's total pinniped biomass). Seals are among the top predators in the Southern Ocean ecosystem and their population levels indicate fluctuations in the flow of photosynthetically-fixed carbon to higher levels of the food chain caused by either climatic or ecological changes. The Antarctic Pack Ice Seals (APIS) programme is designed to evaluate the role of seals in ecosystem processes, trends in population, physiological conditions and behaviour, and seals as processors of carbon. Because pack ice seals are obligatory inhabitants throughout the seasonal ice zone, they are excellent indicators of large-scale environmental change in both temporal and spatial terms. 26/

48. The International Whaling Commission, at its forty-sixth annual meeting, adopted a proposal to establish a Southern Ocean sanctuary where commercial whaling is prohibited. The whale sanctuary was formed by amendment to the schedule to the 1946 International Convention for the Regulation of Whaling. If no objection to this amendment is received, it will become effective from 7 September 1994.

49. SCAR and COMNAP submitted to the XVIIIth ATCM a joint proposal for technical workshops to develop the environmental monitoring necessary to validate environmental impact assessments, assess local pollution and provide an index of the health of Antarctic ecosystems. This will assist in verifying the effects of human activities on other Antarctic life. 27/

50. The IOC has a number of ocean-observing and data-management activities that monitor conditions in the Antarctic area. 28/ These projects include:

Global Sea-Level Observing System (GLOSS): sealevel measurements in Antarctica are particularly valuable for studies of the secular trends in global sealevel. They also contribute to an understanding of the history of glacial loading of Antarctica and of the sensitivity of marginal ice to climate change. Continuing concern about "greenhouse" effects and possible sealevel rise underlines the importance of these studies. GLOSS proposes 26 sealevel stations for the Southern Ocean (south of 60°S); 7 have actually been established;

Integrated Global Ocean Services Systems (IOC-WMO): measurements of temperature and conductivity will improve understanding of thermal interactions and water circulation in the Southern Ocean;

Drifting-Buoy Cooperation Panel (IOC-WMO): the panel was established 10 years ago to achieve optimum use of any drifting-buoy data obtained worldwide to meet the objectives of projects and encourage regional cooperation;

Satellite observations: the IOC works closely with the Committee on Earth-Observing Satellites, WMO and other international organizations to meet remote-sensing requirements in the Antarctic and Arctic;

International Oceanographic Data Exchange: an international data centre has been in operation since 1987 to receive, control, store and disseminate physical and chemical data from research carried out in the Southern Ocean.

51. The Antarctic network is an important component of the Global Observing System (GOS) of the World Weather Watch (WWW) System. The operation and maintenance of the network and the timely transmission of the observational data by means of the Global Telecommunication Systems are essential components of the WWW system. The information is needed for global weather analysis and to make predictions within Antarctica itself. The preparation and distribution of meteorological analyses and prognoses for the Antarctic and specialized forecasts for users, as well as warnings of dangerous weather conditions, are important tasks of the Global Data Processing System. 28/

52. SCAR reported to the XVIIIth ATCM on the Antarctic Data Directory System and Database. The Directory Interchange Format has been adopted and the Planning Group recommends a "six-principles approach" to provide a framework for developing the Directory System. The risks that would cause the system to fail are examined and solutions proposed. 29/

53. COMNAP activities related to data management include joint efforts with SCAR and GLONCHANT. The Antarctic Programme Managers' Information Network is starting an electronic network using the INTERNET for information and document exchange. 19/

54. The same elements that make Antarctica a unique natural laboratory for investigating scientific and conservation problems of global relevance, namely, its ruggedness and ice-covered terrain, also hinder its accurate mapping. In 1990, a consortium consisting of the British Antarctic Survey, the Scott Polar Research Institute and the World Conservation Monitoring Center was formed to address the difficulties in coordinating the creation of a seamless map of Antarctica, the Antarctic Digital Database (ADD) project. 30/ The Antarctic digital topographic database provides cartographic information on compact disc. 31/ ADD can be used to generate customized maps, provide a topographic framework for GIS (geographic imaging systems) applications, and facilitate international collaboration by providing a common base for recording and analysing spatial data. 32/

55. Existing hydrographic charts are incomplete and inaccurate in places and sometimes cause maritime accidents. The IHO cautions that the publication, "Status of hydrographic surveying and nautical charting in Antarctica" contains surveys that may not meet modern standards, and many areas cannot be considered adequately surveyed for safe navigation and require resurveying. 17/

56. COMNAP provided hydrographic information for the IHO PWG effort of mapping Antarctica. COMNAP also determined appropriate sites for long-term monitoring and protocols to ensure consistency. 19/

57. At the XVIIIth ATCM, the Parties agreed that samples and specimens should only be taken for scientific purposes and should be properly curated so that they are accessible to researchers. Chile submitted a paper proposing that, in order to protect samples for scientific use, annex II of the Protocol should be supplemented to include scientific samples, the annual report of animals killed for research purposes in the Antarctic Treaty area should be expanded, and a data bank for the exchange of information should be established. 33/

58. SCAR submitted a recommendation on the protection of geological specimens that states that: (1) geological specimens, such as fossils, minerals, meteorites, volcanic bombs and ventifacts in Antarctica should be collected for scientific or educational purposes and not for commercial gain; (2) geological samples collected from Antarctica for these purposes should be properly curated in institutions accessible to the scientific community and, wherever possible, should be publicly displayed. 34/ SCAR also submitted a suggested code of conduct for the use of animals for scientific purposes. 35/

59. Japan submitted a report on the preserved specimens of moss from Antarctica and adjacent regions housed at the National Institute of Polar Research. 36/ These samples are catalogued and available for study by scientists.

60. Inspections of research stations are required under article VII of the Antarctic Treaty. A number of countries submitted inspection information for

their scientific research facilities in Antarctica to the XVIIIth ATCM. The reports cover selected stations, abandoned stations and vessels. 37/

61. The consensus was that inspections are useful as a monitoring tool to ensure compliance with the Antarctic Treaty and to facilitate the exchange of information, but there was considerable criticism of the current ad hoc system for inspections. Some countries called for balance between often-inspected stations and those that have not yet been inspected, and asked that the issues examined be limited to those within the scope of the Antarctic Treaty.

62. The XVIIIth ATCM noted that inspections are now taking account of the requirements of the Madrid Protocol, in line with the decision of the Parties to implement the Protocol as far as possible pending its coming into force. For this interim period, it was agreed to continue inspections of the matters covered by the Protocol as a means for providing valuable information on the degree to which the Protocol is being provisionally implemented.

63. The need to develop a comprehensive check-list and a more formalized system for implementing the investigations was also discussed at the XVIIIth ATCM. SCAR and COMNAP jointly submitted a paper which included a sample inspection check-list, 38/ as did a number of individual countries.

64. Greenpeace submitted a report describing the condition of Antarctic stations based on inspections done in the 1992/93 austral summer. Areas of concentration in the report are: knowledge of and compliance with the Madrid Protocol, changes since earlier Greenpeace inspections, activity in protected areas, and failures to meet environmental impact assessment requirements. 13/

65. The head of the delegation of the United States presented a report in his capacity as representative of the Depositary Government of the Antarctic Treaty. There are now 42 parties to the Antarctic Treaty with the Czech Republic and Slovakia having succeeded to Czechoslovakia. Argentina, Australia, Ecuador, France, Peru, Norway, the Netherlands and Sweden have become Parties to the Madrid Protocol since the XVIIth ATCM. Tables covering the status of the recommendations adopted pursuant to article IX of the Antarctic Treaty, the parties to the Antarctic Treaty and the parties to the Madrid Protocol were included in the final report of the XVIIIth ATCM.

66. Although the Antarctic Treaty entrusts the depositary Government with a number of the tasks surrounding the operation of the Antarctic Treaty system, nothing within the existing framework provides for an independent secretariat. It was agreed that a small, efficient, low-cost Antarctic Treaty secretariat is essential, but questions concerning its structure, legal status and location remained to be resolved. Some of the preparations needed for a Treaty secretariat that were suggested at the XVIIIth ATCM included developing a budget, listing priority tasks, creating procedures for appointing an executive secretary and determining the legal status of the secretariat. 39/ Many countries provided documents or suggestions at the meeting, including a draft proposal submitted by Italy, 40/ and a paper exploring some of the questions surrounding the legal capacity of the secretariat and its privileges and immunities. 41/

67. The Madrid Protocol affirms that the development of a comprehensive regime for the conservation of the Antarctic environment and dependent and associated ecosystems is in the interests of the global community. In article 2, the protocol adopts a "comprehensive protection" approach, particularly through the designation of the areas south of 60°S latitude as a "natural reserve, devoted to peace and science".

68. The crux of the Madrid Protocol is article 3, which enumerates environmental principles that apply to all Antarctic activities. In the planning and conduct of all actions under the Antarctic Treaty area there are two "fundamental considerations": (1) "the protection of the Antarctic environment and dependent and associated ecosystems" and (2) "the intrinsic value of Antarctica". The second consideration is regarded by legal scholars as being vague and subjective. Paragraph 2 of article 3 prescribes a number of the requirements that must be met to achieve the general purposes set out in the first paragraph. For example, activities in the Antarctic Treaty area must be "planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems". This formulation recognizes that some adverse effects may be unavoidable and thus attempts to limit the extent of the negative repercussions for any activities undertaken in the protected area. 42/

69. At the XVIIIth ATCM, the Antarctic Treaty Consultative Parties described the progress made towards ratification of the Protocol. A number of Parties indicated that the legislative process in their countries was already well advanced and suggested that enactment of their legislation might be expected in 1994 or 1995.

70. The meeting acknowledged that it was desirable to harmonize interpretation of the Protocol's conditions, where possible, and recognized the need to clarify meanings of certain provisions to facilitate this. Given the number of different national legislative approaches, it was acknowledged that it is probably not possible to achieve the uniform application of the Protocol. There was general agreement that practical implementation of the Protocol should be set in motion as soon as possible; proposals were made on how to assist this process.

71. The Madrid Protocol does not have an annex on liability. This omission is recognized in article 16 of the Protocol, which requires the development of "rules and procedures relating to liability for damage arising from activities taking place in the Antarctic Treaty area and covered by this Protocol".

72. A liability regime is essential to the completion of the Protocol for several reasons. First, should an accident occur that threatens the Antarctic environment, it would provide a legal obligation for both immediate and ongoing action to mitigate the effects of that accident. Secondly, where it is not possible to restore the environment to the state it was in before the damage occurred, it would provide for compensation to be paid. Thirdly, by providing legal obligations, it would give Antarctic operators an incentive to be more cautious in the conduct of their Antarctic activities.

73. A comprehensive report on the inter-sessional meeting of the Group of Legal Experts to prepare the annex on liability to the Madrid Protocol was presented by Mr. Rudiger Wolfrum, Chairman of the Group. A draft annex was tabled, together with a summary of the Parties' responses to a questionnaire sent out in preparation for the meeting. 43/ The meeting listed the issues that need to be discussed and included in the annex:

- what activities will be covered;
- what the definition of damage should include;
- the standard of liability (strict liability was favoured);
- operator versus State liability;
- whether damage would be limited to the environment, or include property/personal loss;
- acceptable excuses;
- what compensation scheme should be adopted and its limits;
- how the decision-making body should be structured.

74. These requirements were echoed in the ASOC information paper on a liability annex, which also recommended that there be no exceptions to liability, that liability should be unlimited, and that there be no disincentives for response actions. In accordance with recommendation IV-24, the XVIIIth ATCM extended the mandate of the Group of Legal Experts and agreed to convene another meeting of the group before the XIXth ATCM in 1995.

75. Acknowledging the need to make preparatory arrangements pending the entry into force of the Madrid Protocol, the Antarctic Treaty Consultative Parties recognized that entry into force of the Protocol would also have significant implications for the conduct of Antarctic Treaty consultative meetings. The Protocol sets forth comprehensive environmental protection measures and incorporates provisions to improve the effectiveness and responsiveness of the Antarctic Treaty consultative mechanism, including the holding of consultative meetings and coordination of the components of the Antarctic Treaty system. It also provides for the establishment of a committee on environmental protection to which SCAR and CCAMLR are observers and COMNAP may make contributions.

76. The XIXth ATCM, to be held in Seoul, Republic of Korea, in May 1995, will be organized, as far as possible, to reflect the Protocol's objectives of improving the way in which the Antarctic Treaty consultative mechanism works.

77. Chile submitted a paper on the relationship between the Protocol and other international agreements with a global scope. 3/ Chile recognized that the scope of the survey was limited and recommended establishing the Committee on Environmental Protection to enable the Antarctic Treaty system to respond to demands for global international cooperation.

78. Under both MARPOL 73/78 and the Madrid Protocol, the Antarctic Treaty area was declared a special area. Annex IV to the Madrid Protocol contains detailed references to the close relationship between the MARPOL 73/78 system and the regime established by annex IV on definitions of waste and conditions where its disposal is permissible. The Protocol has a dispute-resolution schedule that may be circumvented by the sovereign immunity exemption provided. Use of MARPOL's paragraph on sovereign immunity could enhance the applicability of the rules of annex IV of the Madrid Protocol. 18/

79. With respect to MARPOL, the non-parties Argentina, Chile and New Zealand are not legally bound by the Convention. However, according to article 13 of annex IV of the Madrid Protocol, the Parties shall keep under continuous review the provisions of that annex and other measures to prevent, reduce and respond to pollution of the Antarctic marine environment, including any amendments and new regulations adopted under MARPOL 73/78, with a view to achieving the objectives of the annex. Since the word "shall" indicates an obligation, even the parties to the Madrid Protocol who did not sign or ratify MARPOL cannot ignore the MARPOL rules. 18/

80. The XVIIIth ATCM agreed that it is important to ensure proper coordination between global environmental agreements and the operation of the Antarctic Treaty system and the Madrid Protocol. The meeting agreed that the requirements for coordination were specific to each of the agreements and that the primary responsibility for ensuring such coordination lay with the Parties to the Antarctic Treaty that were also Parties to the other agreements.

81. It has long been recognized that tourism will affect the environment and that Antarctic-wide measures may provide more general protection for the environment. Recommendation VIII-9 of the Antarctic Treaty contains a statement of accepted principles which Governments are to use their best endeavours to publicize to all those entering the Treaty area. The XVIIth ATCM discussed tourism and non-governmental activities as an agenda item and many countries provided draft proposals.

82. At the XVIIIth ATCM, a number of countries submitted draft recommendations for the conduct of tourism and non-governmental activities in the Antarctic Treaty area. Some areas of consideration included: the obligations of organizations of tourism and independent travellers, actions of States, the role of the Antarctic Treaty Committee on Environmental Protection, the role of consultative meetings, regulations on logistics of tourist activities (including developing guidelines for visitors), monitoring and inspection, insurance, and emergencies. Other recommendations suggested curtailing tourist activity and requiring tour operators to file environmental-impact statements.

83. The ATCM agreed that it would be beneficial to use Antarctic Specially Managed Areas (ASMAs) in some cases to ensure that tourism and non-governmental activities do not interfere with scientific research or have adverse effects on the Antarctic environment. It was suggested that Parties should take this into account when proposing management plans for ASMAs.

84. The Parties at the XVIIIth ATCM agreed on a guide for visitors which advises on appropriate behaviour in Antarctica. The Parties also agreed on a

guide for those who organize and conduct tourism and non-governmental activity in Antarctica, a document which provides information on the relevant requirements of the Antarctic Treaty system, including the Madrid Protocol when it enters into force, and sets out possible procedures to be followed. The Parties agreed to circulate the documents, entitled, respectively, "Guidance for visitors to the Antarctic" and "Guidance for those organizing and conducting tourism and non-governmental activities", as soon and as widely as possible.

85. The International Association of Antarctic Tour Operators submitted to the XVIIIth ATCM an example of an environmental audit and a draft environmental evaluation of several commercial operations. 44/

86. Article VIII of the Antarctic Treaty deliberately left open the issue of jurisdiction in certain situations. Uruguay tabled a paper which reviews existing regulations and highlights areas of ambiguity. 45/ An increasing number of activities involve persons in situations where jurisdiction has not been determined. Agreed rules would lessen the number of potential problems. This issue was placed on the agenda of the XIXth ATCM.

III. CONCLUDING REMARKS

87. Progress continues in the field of international cooperation towards an improved understanding of the Antarctic environment and its dependent and associated ecosystems. In particular, there is increased sensitivity to the environmental consequences of activities in the Antarctic and a growing effort to design and implement measures to prevent, or at least mitigate, the adverse environmental effects of those activities.

Notes

1/ The Antarctic Treaty Consultative Parties are the following: Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, Netherlands, New Zealand, Norway, Peru, Poland, Republic of Korea, Russian Federation, South Africa, Spain, Sweden, United Kingdom of Great Britain and Northern Ireland, United States of America and Uruguay.

2/ A strategy for Antarctic conservation. IUCN, Gland, Switzerland, and Cambridge, England, 1991, p. 1.

3/ Relation between the Protocol on Environmental Protection to the Antarctic Treaty and other international agreements of a global scope. Paper submitted to the XVIIIth ATCM by Chile. ATCM XVIII/WP 31.

4/ Watts, Sir Arthur. International law and the Antarctic Treaty system. Grotius Publications Ltd., Cambridge, England, 1992, pp. 1-2.

5/ Wolff, Eric. The influence of global and local atmospheric pollution on the chemistry of Antarctic snow and ice. Marine Pollution Bulletin, vol. 25, Nos. 9-12, 1992, pp. 274-280.

6/ Ozone depletion and UV-B radiation in the Antarctic - limitations to ecological assessment. Marine Pollution Bulletin, vol. 25, Nos. 9-12, 1992, pp. 231-232.

7/ Antarctic ozone depletion: impacts of elevated UV-B levels on the Southern Ocean ecosystem. Background paper for CCAMLR XII, submitted by ASOC.

8/ Report to the XVIIIth ATCM. ATCM XVIII/Info 83.

9/ Wolff, Eric. "PCBs and chlorinated pesticides in the atmosphere and aquatic organisms of Ross Island, Antarctica". Marine Pollution Bulletin, vol. 25, Nos. 9-12, 1992, pp. 274-280.

10/ Netherlands Antarctic Programme, 1994-2000. Committee on Antarctic Research, Geosciences Foundation, The Hague, Netherlands.

11/ A strategy for Antarctic conservation. IUCN, Gland, Switzerland, and Cambridge, England.

12/ Watts, op. cit., pp. 253-254.

13/ The Greenpeace report on the Antarctic environmental impact monitoring programme at World Park Base, 1991/1992. Greenpeace International, Netherlands. Submitted to the XVIIIth ATCM by ASOC. ATCM XVIII/Info 77.

14/ A waste management strategy for Australia's Antarctic operations. Australian Antarctic Division, Department of the Environment, Sport and Territories. ATCM XVIII/Info 80.

15/ ATCM XVIII/Info 22, Rev.1.

16/ Report submitted to the XVIIIth ATCM by IHO. ATCM XVIII/Info 20.

17/ Status of hydrographic surveying and nautical charting in Antarctica. IHO, October 1992. Submitted to the XVIIIth ATCM.

18/ Preventing the marine pollution of Antarctica: mist over the Southern Ocean. Submitted to the XVIIIth ATCM by IUCN. ATCM XVIII/Info 12.

19/ ATCM XVIII/Info 29.

20/ Cripps, G. C. Natural and anthropogenic hydrocarbons in the Antarctic marine environment. Marine Pollution Bulletin, vol. 25, 1992, Nos. 9-12, pp. 266-273.

21/ "NOAA scientists find Antarctic krill populations far below normal". National Marine Fisheries Service, Southwest Fisheries Science Center, P.O. Box 271, San Diego, California. News release, 11 April 1994.

22/ ASOC report on the XIIth meeting of CCAMLR.

23/ McDonald, Susanne J., Mahlon C. Kennicutt II, and James M. Brooks. Evidence of polycyclic aromatic hydrocarbon (PAH) exposure in fish from the Antarctic peninsula. Marine Pollution Bulletin, vol. 25, Nos. 9-12, 1992, pp. 313-317.

24/ The distribution and abundance of Antarctic and subantarctic penguins. SCAR, Scott Polar Research Institute, United Kingdom, 1993.

25/ Eppley, Z. A. Assessing indirect effects of oil in the presence of natural variation: the problem of reproductive failure in South Polar skuas during the Bahia Paraiso oil spill, Marine Pollution Bulletin, vol. 25, Nos. 9-12, 1992, pp. 307-312.

26/ Antarctic pack ice seals: indicators of environmental change and contributors to carbon flux. An international research programme coordinated by the SCAR group of specialists on seals (draft prospectus), July 1993.

27/ Monitoring in Antarctic. ATCM XVIII/WP 21.

28/ The Southern Ocean: a review of activities in relation to IOC programmes. Background paper approved for presenting IOC-related activities to the General Assembly. IOC/INF-909, Paris, 13 January 1993.

29/ Antarctic data management. SCAR-COMNAP paper submitted to the XVIIIth ATCM by SCAR. ATCM XVIII/Info 31.

30/ Thomson, Janet W. and Paul R. Cooper. A digital map of Antarctica. Mapping Awareness and GIS in Europe, vol. 6, No. 5, June 1992, pp. 21-25.

31/ Copies of the ADD program, ArcView, are available through the SCAR secretariat, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER, United Kingdom. A limited number of copies of ArcView are available free to bona fide researchers and educational establishments.

32/ Cooper, Paul R., Janet W. Thomson and E. Mary Edwards. An Antarctic GIS: the first step. GIS Europe, July 1993, pp. 26-28.

33/ The regulation of the extraction, use and custody of scientific samples obtained in the investigation of the Antarctic. Submitted to the XVIIIth ATCM by Chile. ATCM XVIII/WP 13.

34/ ATCM XVIII/WP 23.

35/ ATCM XVIII/WP 24.

36/ ATCM XVIII/WP 25.

37/ ATCM XVIII/Info 7 and Info 8 (United Kingdom); ATCM XVIII/Info 45 (Sweden).

38/ ATCM XVIII/WP 22.

39/ ATCM XVIII/WP 8.

40/ ATCM XVIII/WP 16.

41/ ATCM XVIII/WP 15.

42/ Watts, op. cit., p. 277-278.

43/ ATCM/XVIII/WP 2.

44/ ATCM XVIII/Info 13 and Info 23.

45/ ATCM XVIII/WP 32.